

Sup Burchard (T. H.)

Operative Interference
IN
Acute Perforative Typhlitis.

BY
T. HERRING BURCHARD, A.M., M.D.

REPRINT FROM
The New York Medical Journal.
January, 1881.



The contents of that number are as follows:

THE NEW YORK MEDICAL JOURNAL is published monthly, and contains 112 closely printed octavo pages. It is devoted to the general practice of medicine, and aims to meet the wants of the general practitioner.

PHYSICIAN FOR DISEASES OF WOMEN TO THE OUT-PATIENT DEPARTMENT OF THE NEW YORK HOSPITAL.

YEARLY SUBSCRIPTION, \$4.00.

OPERATIVE INTERFERENCE IN ACUTE PERFORATIVE TYPHLITIS.*

By T. HERRING BURCHARD, A. M., M. D.,

LECTURER ON SURGICAL EMERGENCIES IN THE BELLEVUE HOSPITAL MEDICAL COLLEGE, ETC.

So gratifying has been the success that has attended the surgical evacuation of abscesses located in the right iliac fossa, that it seems surprising that some definite plan of treatment should not, ere this, have been adopted by the profession, for the relief of those unfortunate cases where the wall of the cæcum itself or its appendage is the seat of the inflammatory process, and in which ulceration, perforation, and death occur with such melancholy rapidity. In a recent and very valuable contribution to the study of perityphlitis,† reflecting the latest views of the profession on this subject, Professor Sands dismisses these rapidly fatal cases thus summarily: "My remarks," he says, "will refer only to those cases of inflammation in the neighborhood of the cæcum in which the disease is circumscribed; as those in which general peritonitis rapidly follows a perforation of the cæcum or vermiform appendix belong to a separate category, and, terminating fatally, are as yet beyond the reach of art, and possess therefore a pathological, rather than a surgical interest."

Four cases of acute perforation of the appendix have fallen under my personal observation, and, as some of these occurred contempo-

* Read before the New York Academy of Medicine, Nov. 18, 1880.

† "Ann. of the Anat. and Surg. Soc.," ii, 8, 1880.



raniously with acute cases of perityphlitis, the opportunities for differential diagnosis between these two affections have been, I believe, exceptionally valuable. The results of this experience I desire to present for your consideration, with the sincere desire that a free discussion may elicit new points of interest, and throw additional light upon the diagnosis and treatment of this obscure and fatal disease.

Typhlitis presents itself clinically in an acute and a chronic form. In the chronic variety, we have a pathological condition lying dormant, perhaps, for years, but manifesting itself at irregular intervals and under special perturbing influences in acute exacerbations. These exacerbations follow the general course of an acute attack. The pathological changes in this condition vary according to the duration of the attack and the intensity of the inflammation. There is catarrh of the cæcum, with thickening and generally partial ulceration of its coats. If the typhlitis has been consequent upon impaction of fæcal or other concretions within the appendix, we find the cavity of the appendix enlarged, its walls frequently studded with the cicatrices of former ulcerations—a condition conducive to perforation.

In the acute variety, typhlitis presents itself under either one of two conditions: *First*, and most frequently, as an inflammatory affection of moderate severity and tending to end in resolution; *Secondly*, as an inflammatory affection of great severity and tending to end fatally from perforation. It is to a consideration of the latter class of cases alone that your attention is requested.

The vermiform appendix is attached to the lower posterior wall of the cæcum, and is usually directed upward and inward, lying coiled upon itself and invested by a distinct fold of the peritonæum. When swollen by inflammation, or distended with fæcal or other concretions, this coil unravels, and the appendix projects directly into its peritoneal envelope. The walls of the appendix, relatively to those of the contiguous intestine, are somewhat thinner and materially weaker. To test this latter fact, sections from four sets of intestines were respectively fastened over the escape pipe of a blast furnace, and subjected to a pressure sufficient to produce rupture. In each instance the rupture was in the appendix. Its vascular supply, in comparison, is likewise less than that of the main bowel, as any ordinary injection will demonstrate—an important fact bearing upon its liability to undergo necrotic change, in case its vessels should become occluded or their circulation be materially retarded by pressure from overdistention, as in case of impaction within the appendix.

Such are the anatomical peculiarities of the appendix, and from them its proneness to ulcerate and rupture under certain morbid conditions is quite apparent. The great danger, however, attendant upon such rupture lies in the contiguity of the appendix to the peritonæum, and in the possibility that rupture may occur before adhesive inflammation has agglutinated the two peritoneal surfaces, and so shut off the general cavity from contact with irritating exudations. Typhlitis occurring under the latter condition, and after the formation of adhesions, may terminate in suppuration and the establishment of a free communication between the gut and the sub-peritoneal areolar tissue, without eventuating in those disastrous sequences which follow fæcal extravasation into the peritoneal cavity. Recognizing the immunity afforded by these adhesions, surgeons are agreed that, in the treatment of perityphlitic abscesses, operative interference if possible should be deferred until the probability of the existence of adhesions is established.

Primary typhlitis with perforation, occurring *before* the formation of adhesions, when fæcal extravasation through the rent and into the peritoneal cavity may readily occur, presents a condition fraught with most imminent peril, and of alarming mortality. Chomel, Louis, Rokitansky, and Jenner positively aver that they never knew a case to end in recovery; Professors Flint* and Janeway, that in their experience no case presenting well-marked evidences of acute perforation of the appendix has ended in recovery. In twenty-seven recorded cases of typhlitis, as in four occurring in my own practice, where the disease pursued an acute course of from one to eleven days, and which were attended with every reasonable evidence of perforation, in every instance a fatal termination is recorded—a melancholy commentary, indeed, on the efficacy of our present methods of treatment.

Death under these circumstances occurs either from shock, from peritonitis, or from a combination of the two. In the 31 cases cited, 5 patients died from shock; 24 from peritonitis; 2 from shock and peritonitis combined.

Of those dying from shock,

- 1 died in 9 hours.
- 1 " " 13 "
- 1 " on the 2d day.
- 2 not stated.

Of those dying from peritonitis,

- 5 died in 24 hours.
- 1 " " 30 "
- 9 " on the 2d day.
- 4 " " 3d "
- 2 " " 4th "
- 1 " " 9th "
- 1 " " 11th "
- 3 not stated.

* Personal communication.

It will thus be seen that the deaths from shock, relatively to those from peritonitis, are in the proportion of about one to five. It will further be noticed that the deaths from peritonitis within the first forty-eight hours far exceeded those occurring at any other period. Autopsies are recorded of three of the five who died from shock, and in each instance special mention is made that the peritonæum was found normal. Of those dying from peritonitis, the autopsy revealed only "a faint cloudiness of the peritonæum around the point of extravasation" in one, and "a very thin layer of lymph with about a tablespoonful of clear serum" in the other, of the two who died within the first twenty-four hours; while, in seven of the nine cases of those dying on the second day, it speaks of the peritonæum as being but immaterially affected—"a slight congestion" in the one, "a moderate infiltration" in another, "a thin layer of fresh lymph" in a third—descriptions that would warrant the inference that the symptomatic manifestations of the peritonitis, the abdominal pain, the depression, the vomiting, the tympanites, the final collapse, were out of all proportion to the local pathological changes.

From the foregoing it is evident that acute perforative typhlitis is a most malignant disease, killing either rapidly from shock or, in the course of a very brief period (the second day the most frequently), from acute general peritonitis. In the face of so terrible a mortality the question naturally arises, Is this disease necessarily fatal? Are its anatomical lesions of such a nature as to effectually thwart all therapeutic or operative interference? Is Science absolutely impotent to save; is her arm irredeemably paralyzed? Does human life indeed hang in such jeopardy that an insignificantly minute perforation of the intestines puts at defiance all the vaunted skill of the healing art? The great gravity of the situation is conceded, and, alas! it must be admitted that all hope from therapeutic and medical relief in these cases lies buried under an overwhelming mortality. But does it necessarily follow that all the resources of science have been exhausted, and that one so struck down in the vigor and prowess of health must of necessity die?

In the sincere and conscientious belief, founded upon a comparison of the pathological conditions underlying this affection, with a careful study of the histories of recorded and personal cases, that *timely* surgical interference may in a certain percentage of these cases bring relief and save life, the following propositions are presented: *First*, The lesion of acute perforative typhlitis is not of itself necessarily fatal, but derives its fatality from the rapid development of intercurrent and fatal complications—shock consequent

upon perforation of the bowel, and peritonitis consequent upon fæcal extravasation. *Secondly*, The patient, once resuscitated from shock, is yet imminently menaced with peritonitis. *Thirdly*, The irritating action of the extravasated fluids upon the peritonæum being recognized, is not the responsibility forced upon us to relieve the peritonæum of this source of irritation prior to the development of acute and fatal inflammation? *Fourthly*, That lumbar typhlotomy (as I would respectfully suggest the name for the operation), properly performed before the development of peritonitis, ought to give an additional chance for life. *Fifthly*, That, while the proposed operation performed under such desperate extremities can never be expected to furnish even average successful results, nevertheless its mortality should be no argument against its employment, if thereby a single additional chance for life is offered.

Perforation of the intestines from any cause, while always a serious, is not necessarily a fatal lesion. Tweedie, Todd, Ballard, Fox, Bell, and Murchison positively state that they know of recoveries. Perforation of the bowels from penetrating and gunshot wounds has ended in recovery. Any of the commentaries on military surgery will furnish numerous illustrations of the curability of intestinal wounds. In civil practice the statistics are naturally not so rich; still there are some remarkable recoveries from most serious intestinal injuries. Gant * reports the case of a madman who stabbed himself in the abdomen eighteen times. Eight of these wounds penetrated the intestines, as was shown a year and a half afterward at the autopsy; and yet from these extensive injuries the man entirely recovered. John Bell † relates the case of a boy gored a number of times by a bull; the intestines protruded and were replaced. There was vomiting of blood, and there were bloody stools. The day following, the poor lad walked three miles from his village, carrying his intestines in the skirts of his coat. Again they were replaced, and the boy recovered. Professor Hamilton ‡ reports the case of a man twenty-five years old, who fell from a table on to an iron rod four feet and a half in length, nearly half an inch in breadth at the point, and expanding rapidly to a breadth of five eighths of an inch, with a rough surface. It entered the abdomen four inches below the umbilicus and two inches to the right of the median line, and came out upon the back on the same side, two inches from the center of the spine and about opposite the last dor-

* "Surgery," vol. ii, p. 461.

† Quoted by Gant, *op. cit.*, vol. ii, p. 461.

‡ "Buffalo Med. Jour.," Jan., 1859.

sal vertebra. He immediately arose and pulled out the rod himself. He then walked across the street and sent for his physician. Eight days after, he was found sitting up in bed, amusing himself with his violin.

The numerous gastrotomies and enterotomies that have been reported of late, not only demonstrate that the hollow viscera can be boldly and freely incised, and the wound be successfully closed, but they give encouragement to surgical innovation in these acute cases of perforation.

Considering the hazardous character of these operations, the success which has attended them has been surprisingly satisfactory. The special pathological condition, perhaps, which most nearly approximates the lesion of perforative typhlitis is that which exists in certain cases of strangulated hernia, where circumscribed sphacelation has occurred. These cases, if left without operative interference, invariably terminate fatally. With an operation and the establishment of an artificial anus, recovery is by no means infrequent.

It certainly seems singular, in the light of these illustrations, that injuries of such gravity can be recovered from, while a minute perforation of the appendix is so fatal. A partial explanation of this discrepancy can probably be found in the fact that, when a wound occurs in the intestinal wall (I refer now to punctured wounds), there is an immediate eversion of the mucous membrane, which effectually closes the aperture. In the appendix we have no such redundancy of tissue. The perforation is the result of molecular disintegration with loss of tissue, and extravasation follows immediately. So far as the peritonæum is concerned, there is probably no greater tolerance in the one instance than in the other.

The anatomical lesion of perforative typhlitis not being of itself necessarily fatal, the disease derives its fatality from the development of intercurrent and fatal complications—shock consequent upon perforation, and peritonitis consequent upon faecal extravasation.

Acute typhlitis may present itself, as we have remarked, under either one of two conditions. Ordinarily, it is an affection of moderate severity, ushered in with local distress, and accompanied with more or less symptomatic disturbance. Fever, of greater or less intensity, anorexia, nausea, vomiting, and constipation are present. Tenderness and distress, rather than acute pain, are the most prominent, as well as the most annoying symptoms. In proportion as the peritonæum and adjacent cellular tissue become involved in the inflammatory process, the severity of the pain increases. From

paralysis of the walls of the intestines, or from some abnormality of function by which the peristaltic action is diminished, accumulation of fæces within the cæcum is of pretty constant occurrence. As a result of this accumulation, tumefaction of the cæcum occurs. The tumor which is thus formed, sometimes with great rapidity, must be distinguished from the tumor of perityphlitis, with which it might be confounded.

Circumscribed peritonitis has been so generally associated with typhlitis, that I was quite surprised to find that two of my own autopsies, on subjects who had each had several attacks of typhlitis, failed to give any positive evidence of the preëxistence of this disease. While this statement is at variance with the general literature of this subject, it accords with the records of such few autopsies as have been published. Peritonitis, doubtless, often does complicate typhlitis, but I believe it to be more frequently associated with perityphlitis than with typhlitis proper. The disease usually runs an acute course of from seven to fourteen days—in mild cases, from three to five days—and ordinarily terminates favorably either in resolution or in suppuration. It would be quite germane to our present purpose to continue the history further. I have ventured to trespass upon your indulgence in presenting the salient and familiar features of an acute attack, that I might thereby the more forcibly emphasize that sudden and alarming change in our patients' condition that predicates with only too fatal certainty the occurrence of perforation. Perforation, as a rule, does not occur in the first attack of typhlitis, except in those rare instances where the inflammation is due to the presence of some foreign body, as a cherry-stone or an orange-seed, within the appendix. On the contrary, there is a repetition of mild acute attacks. Ultimately, however, owing to the pathological conditions to be cited, or to the unusual severity of the inflammation, perforation of the appendix occurs. In reviewing the literature of the subject, it is remarkable that a previous history of constipation, with mild intercurrent attacks of typhlitis, is given in nearly all of the cases recorded. Perforation may occur at any moment during the continuance of the inflammation. Fortunately, however, in most instances in which this accident has occurred it has happened late in the course of the disease, and after peritoneal adhesions have formed. The exception is found in those who have been the subjects of mild and repeated attacks of acute typhlitis—subjects in whom the cæcum and vermiform appendix have been chronically distended, their walls having become permanently weakened, both from atrophy and from the presence of cicatricial tissue and excavated ulcerations.

With the rupture of the gut, certain subjective symptoms arise that are not without significance. Not infrequently there is a distinct sensation complained of, as if something within the body "had given way." This is accompanied at first with oppressive nausea and faintness, but is speedily succeeded by the sharp, intense, and characteristic pain caused by contact of the extravasated gases or fluids with the highly sensitive peritonæum. Shock, more or less profound, rapidly supervenes. The patient's condition is now hazardous in the extreme. No description, however dramatic, could convey any adequate conception of the sufferer's condition. The patient, ghastly white and with countenance expressive of the keenest anxiety, lies bathed in a cold and clammy sweat. His features are shrunk and drawn; the eye is listless and dead; the nose is pinched and thin; the lips are blue and so drawn as to expose the teeth. Hopelessness, agony, and despair are imprinted on every lineament of the face. The respirations are costal and shallow. The pulse is rapid and weak. The voice is faint and high-pitched. The urine is retained, but the fecal dejections are passed unconsciously, and persistent hiccough and vomiting add to the sufferings of the patient and the seriousness of the situation.

The depth of the shock by which the patient is overwhelmed seems to bear no relation whatever to the extent of the intestinal lesion. No author, I believe, makes mention of this fact, but a comparison of the histories of several recorded cases with the lesions, as revealed at the autopsy, warrants the statement. Two cases occurring in my own practice furnish excellent illustrations. In one, that of a man thirty-two years old, of magnificent physique and perfect health, the shock was overwhelming. There was complete prostration and collapse, positive reaction not occurring for upward of six hours, when the patient gradually rallied, to die, on the fourth day, of peritonitis. The autopsy revealed an enlarged and dilated appendix, with a perforation no larger than a pinhole. In another case, that of a feeble woman fifty-nine years old, the shock was comparatively insignificant, although nearly one quarter of the appendix had sloughed off. Shock, then, proves the immediate cause of death in about twenty per cent. of these unfortunate cases, and, if the patient can be rallied from this condition by energetic and skillful treatment, it will be to pass the next twelve to eighteen hours in comparative comfort, at the expiration of which brief interval peritonitis, of a rapidly fatal type, sets in.

It is in this short but highly critical period, after the patient has rallied from the first depression of shock, and before the advent of peritonitis, that operative interference, if it is to avail aught, is to

be employed. To delay until after the development of general peritonitis is fatal. A human life perchance hangs upon the disposition of an hour, and valuable time should not be hopelessly sacrificed, either in a too scientific desire to make a positive diagnosis, or in a vain but idle trust that by some miraculous providential interposition the life of our patient will be spared.

DIAGNOSIS.—Whatever, if any, the value of this paper, it hinges upon our ability to recognize perforation prior to the occurrence of peritonitis. The possibility of this becomes, then, a question of the most serious importance, but one which, with due care, can in most instances, I believe, be satisfactorily demonstrated. The grounds for diagnosis in this, as in many other obscure abdominal affections, do not rest upon the existence of any one pathognomonic symptom. The previous history, if it can be obtained, and the individual symptoms as they arise, afford in their totality fair presumptive evidence of the nature of the lesion.

In how important a manner the history of previous attacks of typhlitis bears upon the diagnosis, we can surmise from what has already been said upon the clinical history of the disease. Acute idiopathic perforation in an appendix that has not been subject to previous pathological change is one of the rarest of accidents. As we have remarked, in nearly all the cases recorded, the perforation has occurred in those who have been subject to previous attacks of cæcal distress consequent upon fæcal impaction, and *the fatal attack has invariably been preceded by previous attacks, more or less aggravated, of acute typhlitis.* A satisfactory clinical history once obtained, much of the doubt that would otherwise exist is at once dispelled.

Pain is a second factor in the diagnosis. The pain, to be significant of perforation, must be developed acutely, and its seat of greatest intensity must be at or near the known situation of the appendix. The seat of greatest intensity can be determined, with approximate accuracy, by fixing the bowels from the opposite side with the left hand, and making deliberate pressure over each half inch of the abdominal surface. An examination thus conducted will frequently furnish important information to the experienced diagnostician under circumstances in which a careless and superficial palpation would furnish only negative results. The pain at first is sharp and localized, and pressure over the point of perforation is not infrequently accompanied with reflex sensations of nausea and faintness. Acute pain *per se* does not warrant the inference of perforation. We have very great pain in many other morbid conditions affecting this region—notably in intussusception, in ileus, in

hernia, in inflammation in or about the right ovary, in the passage of a renal calculus down the right ureter, in acute inflammation of the cellular and muscular structures of the right iliac fossa, and in functional and inflammatory disturbance in the gut. The pain must be localized; and this, when taken in connection with the clinical history, enables us to predicate the nature of the lesion with reasonable probability.

Shock is a third factor in the diagnosis. This is more or less rapidly developed in all cases of intestinal perforation, and ranges in intensity from syncope, coming on coincidently with perforation, to severe and overwhelming collapse. In the thirty-one cases cited, death in five of them was directly attributable to this cause. No class of injuries, probably, is followed more speedily by collapse than are those affecting the hollow viscera of the abdomen. It is the rapidity and overwhelming character of the shock that often first direct our attention to the abdominal cavity as the seat of the disease; and it is the shock, when taken in connection with the pain and the clinical history, that renders the diagnosis quite as positive as it can be in a lesion whose nature necessarily is so obscure. With these considerations on the pathology, clinical history, symptomatology, and diagnosis of acute perforative typhlitis, I desire to present briefly the histories of four cases of the disease which have fallen under my personal observation, and the treatment which an unprejudiced study of the subject leads me respectfully to suggest.

CASE I.—Mrs. M. C., aged fifty-nine, was convalescing from an attack of acute lobar pneumonia of the right lung, followed by a severe attack of diphtheria, during which she had been attended conjointly by Dr. T. A. McBride, of this city, and myself. The pneumonia had resolved satisfactorily, considering the age of the patient; and the diphtheritic exudation, which had not been very extensive, had entirely disappeared. There was every prospect of a favorable convalescence. On March 28, 1875, she complained of constipation, which was probably due to the large doses of iron she was taking. The iron was stopped, and she was ordered a laxative diet. 29th.—A. M.: No movement of the bowels; much distress from constipation. Ordered a dose of oil, guarded with laudanum. 4 P. M.: No movement; intense pain in the right iliac fossa. Ordered a large enema of soap-suds. 7 P. M.: A copious movement occurred after the enema, followed by syncope; patient very much exhausted; pulse 92, feeble; respirations 28; temperature 99° F. She indicates a painful spot in the right iliac fossa, two inches and a half above Poupart's ligament and three inches from the median line. This spot has pained her for years, she says, whenever her bowels have become constipated. Pressure on this point produced a sense of faintness, which was accompanied by vomiting of a sour, bilious matter. Ordered opium, stimulants, and hot fomentations. 11 P. M.: Seen by Dr. McBride. Perforation suspected by him, and fatal peritonitis prognosticated. 30th.—7 A. M.: Patient apparently

better. Slept well. No pain except on pressure over the spot indicated; no tympanites; no tumefaction. Dr. McBride maintained his diagnosis of perforation. *31st.*—2.30 A. M.: Patient bloating rapidly. Pain general over the abdomen. Hiccough and vomiting. 11 A. M.: Tympanites excessive. Respiration difficult. Extremities cold. 4 P. M.: Patient unconscious. 7 P. M.: Exactly forty-eight hours from the moment of attack, she died.

Autopsy, April 2d.—The abdomen only could be examined. An incision through the linea alba to the peritonæum revealed that membrane apparently healthy, although greatly distended with gas. On opening into the abdomen, about an ounce of pinkish serum was found. The colon and cæcum were found distended with pultaceous fecal matter that was exceedingly offensive. The walls of the appendix were very much thickened, although they were entirely free from adhesions. Its lower fourth was gangrenous, and it was swollen to the size of my little finger. It was tightly packed with hardened feces, which exuded from it like oil paint from a tube. These were afterward dissolved in water, but no solid concretions were found. The peritonæum over the point of rupture was slightly congested and stained apparently by extravasated feces. A few isolated patches of lymph were found.

CASE II.—I was requested by Dr. Carradine, of this city, to see Mr. James M. P. in consultation September 25, 1876. Found him suffering from acute general peritonitis, with the following history. Three days previous, after unusually close application to business, he found himself feeling generally unwell. Being a pharmacist, he prescribed for himself five grains each of quinine and rhubarb, and two of calomel. The following morning, as the medicine had not operated, he took a bottle of citrate of magnesia. At 4 P. M. there had been no operation, and he took a dose of oil. 6 P. M.: No operation. He drove to a Turkish bath, hoping to get relief. After the bath, and while being shampooed over the abdomen, he experienced intense pain in the right iliac fossa, accompanied with vomiting and prostration. He had had similar pain before, but not so severe, when suffering from constipation. He remained in the bathing establishment several hours, during which time he drank nearly a quarter of a bottle of brandy, and had several attacks of syncope. He slept in his store all night, being too weak to get up-stairs to his bedroom. He experienced intense pain, with uncontrollable faintness. Peritonitis set in on the second day. He was seen by Professor Loomis, Dr. Carradine, and myself. The diagnosis of peritonitis was concurred in. Dr. Loomis says, "Perforation probably occurred coincidently with the first attack of pain and syncope." Death took place on the seventh day. No autopsy.

CASE III.—Mr. J. C. S., aged thirty-two, had always been in perfect health. He was six feet one inch in height, and weighed 220 pounds. He had suffered for the last five years more or less with chronic constipation, with occasional attacks of "colic" in the right side. He generally took a dinner pill at night, recommended to him by Professor Metcalf. He had twice had "inflammation of the bowels." June 29, 1878, he was suddenly seized, while bathing, with intense pain in his right side. He had had some soreness there for a couple of days. All his trouble, he said, had started from this same place. The night before, he had taken a dinner pill, and that morning a tumblerful of Friedrichshall water, neither of which, however, had acted. 11 A. M.: The intensity of the pain drove him to his room. At 12 noon he was found, with his clothes on, lying across the bed—apparently dying and moaning piteously; respirations very feeble; pulse not

perceptible. I was immediately summoned. Hypodermic injections of brandy and musk were freely given, in conjunction with rectal injections of warm milk punch. The body was enveloped with a huge sinapism, and surrounded with bottles of hot water. Slight reaction occurred in about thirty minutes—consciousness being slowly restored, under inhalations of nitrite of amyl. There was no positive reaction, however, until 5.45 p. m.: pulse 118; respiration 24; temperature 103.25° F. Midnight: patient sleeping nicely; pulse 122; respiration 28; temperature not taken. 30th.—8 a. m.: Pulse 112; respiration 20; temperature 101°. Slept well all night. Feels “tip-top”; wants his breakfast. Much irritated at being restricted to milk. Pain on pressure in the right iliac fossa; slight tympanites. Turpentine stupe ordered over the abdomen; one grain of opium every hour. 12 m.: Feels comparatively comfortable. Is determined to get up—says he is “not sick.” July 1st.—7.30 a. m.: Sat up against orders, remaining up thirteen minutes. Took to his bed again from intense pain in the right iliac fossa. I saw him shortly after: pulse 110; respiration 24; temperature 100°. There was slight puffiness over the cæcum, but no tumefaction. Gave a hypodermic injection, and ordered the stupes and opium to be continued. 5 p. m.: Pain more severe, with some disposition to vomit. Gave a hypodermic injection of sulphate of atropia gr. $\frac{1}{80}$. Opium to be increased to three grains every two hours. 7 p. m.: Pain not so severe; still some nausea—relieved by a hypodermic injection of atropia. Pulse 112; respiration 18; temperature 101.25°. 2d.—4 a. m.: Opium has been given, three grains every two hours, since last visit. Pulse 134; respiration 16. Abdomen more distended, though not excessively so; has no pain, except on pressure. Ordered tincture of veratrum viride, \mathfrak{m} ij every half hour, until the pulse was brought down to 110; then every hour until it was brought down to 100. 8 a. m.: Pulse 114; respiration 13; temperature 102°. He has taken, in all, thirteen minims of tincture of veratrum. Pain still persists in the old spot, and the general abdominal pain is worse, also the tympanites. The patient continued to grow worse until the afternoon of the 3d (fourth day), when he died.

Autopsy, July 5th.—A most thorough search failed to show any lesion other than a pinhole perforation through the distal extremity of the appendix and a catarrhal condition of its lining membrane, with a second ulceration, non-penetrating, near the first. The cæcum and the appendix were distended with soft faecal matter. In the right iliac fossa the peritonæum might have been a trifle more opaque than the general surface—otherwise it was normal. The intestines were enormously distended with gas.

CASE IV.—G. W. T., aged twenty-eight, a bookkeeper, was suddenly seized, May 15, 1880, while writing at his desk, with intense darting pain through the side of the abdomen. The pain was followed with vomiting and faintness. I saw him at 3 p. m. The first attack had occurred at 11 a. m. I found him lying on his back with the right leg drawn up, moaning piteously and begging for ice-water, which was ejected as soon as swallowed. His bowels had moved twice during the day. The extremities were cold, and the body was covered with a clammy sweat. Pulse 106, very weak; respiration 18; temperature 97.75° F. He complained of pain in the right iliac fossa, but there was no tumefaction or swelling of the abdomen. Ordered opium, stimulants, and hot fomentations. 9 p. m.: Reaction fair; patient easier. Pulse 118; respiration 22; temperature 101.5°. He says this is the third attack of the kind he has had during the last two years, and the worst of all. Says his bowels have not been moved for three days. He took a

large dose of castor-oil last night. Ordered absolute rest; opium one grain every two hours; hot fomentations to be continued. *16th.*—9 A. M.: General condition better. Pain on pressure in one spot, which might be included in a circle of a diameter of three inches, four inches above Poupart's ligament, and about four inches from the median line. *17th.*—The evening of the second day, after slight retching, violent peritonitis developed. The patient died the following afternoon—the third day.

Autopsy.—This revealed palpable evidences of peritonitis, with a slight deposit of lymph around the appendix; also adhesions of the appendix to the peritonæum. The appendix contained faecal matter and a mass of berry seeds, and revealed a small, round ulceration on the anterior side near its distal extremity.

Reviewing these cases in the light shed upon them by the autopsies, the question at once suggests itself, Were they of necessity fatal in themselves? Could no expedient have been adopted in these instances, whereby valuable life might have been saved? Recognizing the impotency of medication to arrest the disease, why not under such circumstances proceed at once as we would in a case of purely surgical disease, in which the indications for operative interference would be positive and absolute? Guarded by every antiseptic precaution, why not in such cases cut down on the perforated appendix from the side, as in Amussat's operation; wash the adjacent peritoneal surface with disinfectants, so cleansing it of all irritating exudations; secure the ulcerated appendix to the mouth of the wound by stitches, and so afford free and perfect external drainage? Would the chances of such a patient be imperiled by the operation, or would his condition be worse than is that of one after ovariectomy, the Cæsarean section, or Battey's operation? Cicatrization, it seems to me, would occur in the ulcerated appendix, and the artificial anus thus formed would doubtless behave in this instance as it usually does, and would close in a short time. Surgeons do not hesitate to invade the peritonæum and extirpate the ovaries and the uterus when the exigency is far less critical, and the recovery of their patients justifies the risk of the operation. The peritonæum is daily manifesting a tolerance to surgical interference that was never dreamed of, and the triumphs of peritoneal surgery are becoming more and more brilliant as the field for its operation enlarges.

The operation is readily performed. The appendix is easily reached by a transverse incision commencing two inches in front of the longissimus dorsi muscle, and extending forward about six inches. Integument, fascia, muscles, are carefully divided until the peritonæum is reached; this is opened, and the appendix is exposed. This operation I have frequently performed on inferior animals,

and invariably with success—the artificial anus closing in from a week to ten days. Performed at an early period, before the occurrence of general peritonitis and under the protective influence of antisepsis, that the dangers of septic poisoning may not be added to those already existing, I believe that this operation offers a better chance for life than any procedure at present practiced for the relief of this terrible disease. Professor Gouley,* before the Surgical Section of the American Medical Association, at its last meeting, in this city, expressed emphatically his belief in the feasibility of an operation performed under such circumstances. Dr. Vanderveer, of Albany,† in a communication to the “Medical Gazette,” expresses his regret that in certain cases of perforative perityphlitis he has not cut down upon the perforated intestine.

In closing, permit me, as equally pertinent to this operation, to quote Mr. Jacobson,‡ surgeon to Guy’s Hospital, on operative interference in intestinal obstruction. “I know,” he says, “how fatal such operations have been, but I also know that very rarely (I speak of acute intestinal obstruction) a case gets well if left to itself. To some, the very recommendation of an operation at all may savor of that rashness which comes of inexperience. I would reply that the very want of success in previous operations is accounted for by the fact they were not performed under those conditions which I am about to point out as being essential to success. Above all, the operation must be performed earlier than has heretofore been the case. It is hopeless to perform it when symptoms of peritonitis or enteritis have set in. Those who wait, as I venture to say too many have waited, till the abdomen is generally and enormously tympanitic, till the temperature is persistently high, or is only falling before the inevitable end, till the pulse is running down, and the patient is in a condition of irrecoverable collapse—those who wait till any or all of these conditions are present had far best not operate at all.”

Mr. Teale,§ speaking of the operation for intestinal obstruction, says: “The object of my paper was to reduce the dread of peritonitis to what I believe to be a more true position in the treatment of intestinal obstruction, and to maintain that, in those cases in which recovery seems hopeless unless surgical relief can be given, we need not be deterred by the fear of peritonitis from submitting the patient to the ‘safer risk’ of exploration. Many will prove to be

* Personal communication.

† “Brit. Med. Jour.,” Sept. 27, 1879, p. 493.

‡ “Med. Gaz.,” March 27, 1880.

§ *Ibid.*, p. 494.

hopeless from the beginning, some will prove to have submitted to the operation too late, a few will recover as the direct result of the operation."

Howard Marsh * says: "Shall we ever know what percentage of cases of obstruction might be saved by surgery until we adopt the rule of operating before peritonitis and other serious local changes have set in, and before the patient's strength has slowly ebbed away? As to the danger of opening the abdominal cavity, is it more dangerous to open it before material changes have ensued, and divide a constricting band or release an intussusception, or establish a false anus, than it is to open the abdominal cavity and to remove a large tumor of which perhaps much is solid, and which is, perhaps, extensively adherent to the intestines, the omentum, or the uterus?"

Mr. Bryant † says: "I am quite aware that, in advocating early interference in these examples of acute obstruction, I shall be met with observations regarding the difficulty of diagnosis, which I respect, and that under these circumstances so severe a measure as laparotomy should not be undertaken. But I do not see the matter in that light; for I maintain that it is not required of the surgeon to diagnose the precise cause of the obstruction, so long as the diagnosis of its existence can be determined, and do not think that, because such cases as these occasionally recover without operative interference, we should forget that a large majority die miserably, unrelieved. I plead, therefore, for the majority."

In closing this paper upon operative interference in acute perforative typhlitis, permit me to add that before these unfortunate patients are permitted to die without a last hope being held out to them, even though the diagnosis between it and some obscure intestinal obstruction be not absolutely positive, it would be better, far better, it seems to me, to open the abdominal cavity and relieve a concealed hernia or an invaginated gut, or reduce an ileus, or divide constricting bands of old peritoneal adhesions—diseases the severity and identity of whose symptoms might perchance lead to an error in diagnosis—than to have revealed at the autopsy a condition which might have been obviated by timely surgical interference.

The dread of opening the peritoneal cavity which has held the profession in docile fear these many years, and by which thousands of valuable lives have been sacrificed, is disappearing before the

* "Trans. of the Clinical Soc. of London," vol. xii, p. 103.

† "*Ibid.*, p. 109.

brilliant achievements of ovariologists the world over. Undue haste and unwarranted interference can nowhere be more severely reprobated than in operations attended with so great risk as those involving an opening into the cavity of the abdomen. Still, timidity and prudence are not convertible terms, and timidity shrinks before the operation which the prudent surgeon, who operates with a full appreciation of the responsibilities he assumes, would carry through to a successful and happy culmination.

